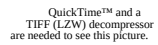


Carbon Credits: New Opportunities for U.S. Livestock Industry

Environmental Credit Corp.'s Carbon Credit Program for Agricultural Methane Projects

Jim Jensen, VP Business Development

AgSTAR Conference, April 2006

“Four Dairies and a Port”

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Leaders in the Industry

Changing Environments

- Energy crises » opportunities
- Regulatory changes » challenges
- Climate change » new markets

Keys to SUCCESS

- Vision and innovation
- Deploy new technology
- Turn weakness to strength

Innovations in Agriculture

Haubenschild Dairy, MN — plug flow digester

Vanderhaak Dairy, WA — plug flow digester

Hilarides Dairy, CA — covered lagoon

Bos Dairies, IN — plug flow digesters

Port of Tillamook, OR — community digesters

Improved manure management

Renewable energy

Co-products

Carbon credits

What are carbon credits?

- Certified reductions in greenhouse gas emissions
  - Real, quantified, verified, certified emission reductions
  - Expressed as metric tons of CO_2 equivalents
- "Cap and trade" framework
  - Emissions reductions goals ("cap")
  - Credits allow overall goals to be reached efficiently ("trade")
- Regulations requiring emissions reductions
  - Kyoto Protocol
  - McCain/Lieberman, Hagel, Bush Administration approach
  - California Climate Action Registry, Western Governor's Initiative, RGGI (Northeastern states)
  - Voluntary regulatory programs: Chicago Climate Exchange, EPA Climate Leaders

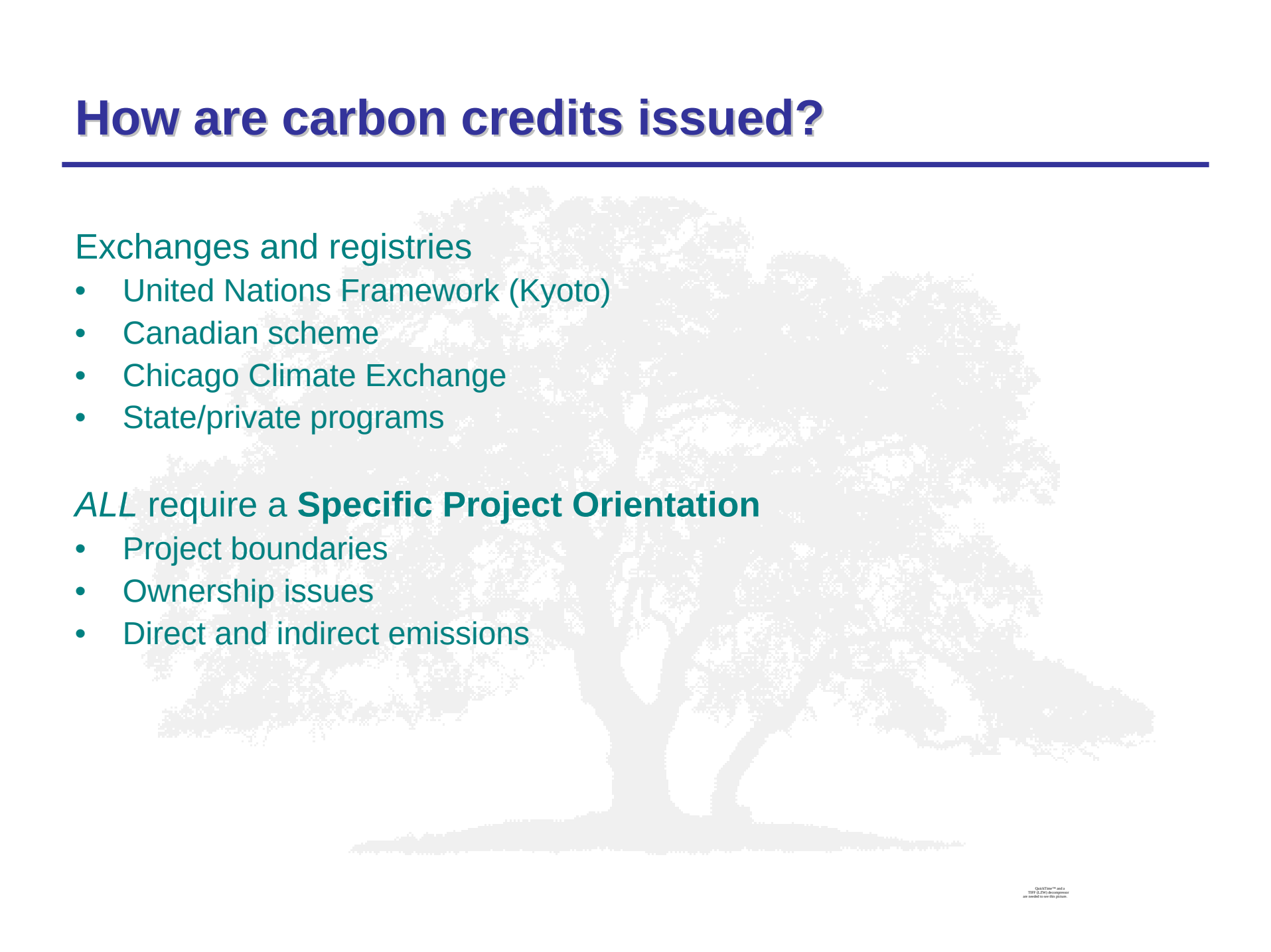
How are carbon credits issued?

Exchanges and registries

- United Nations Framework (Kyoto)
- Canadian scheme
- Chicago Climate Exchange
- State/private programs

ALL require a **Specific Project Orientation**

- Project boundaries
- Ownership issues
- Direct and indirect emissions



Steps to Creating/Selling Carbon Credits

1. Project delineation
2. Registration
3. Protocol development
4. Measuring
5. Monitoring
6. Verification
7. Certification
8. Credit issuance
9. Credit aggregation/sale

Potential Manure Projects with Carbon Credits

- Covered lagoon (with or without generator)
- Anaerobic digester (plug flow or complete mix)
- Manure diversion to approved beneficial use, e.g. gasification or composting

These projects may also be used as mitigation for dairy air emissions.

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

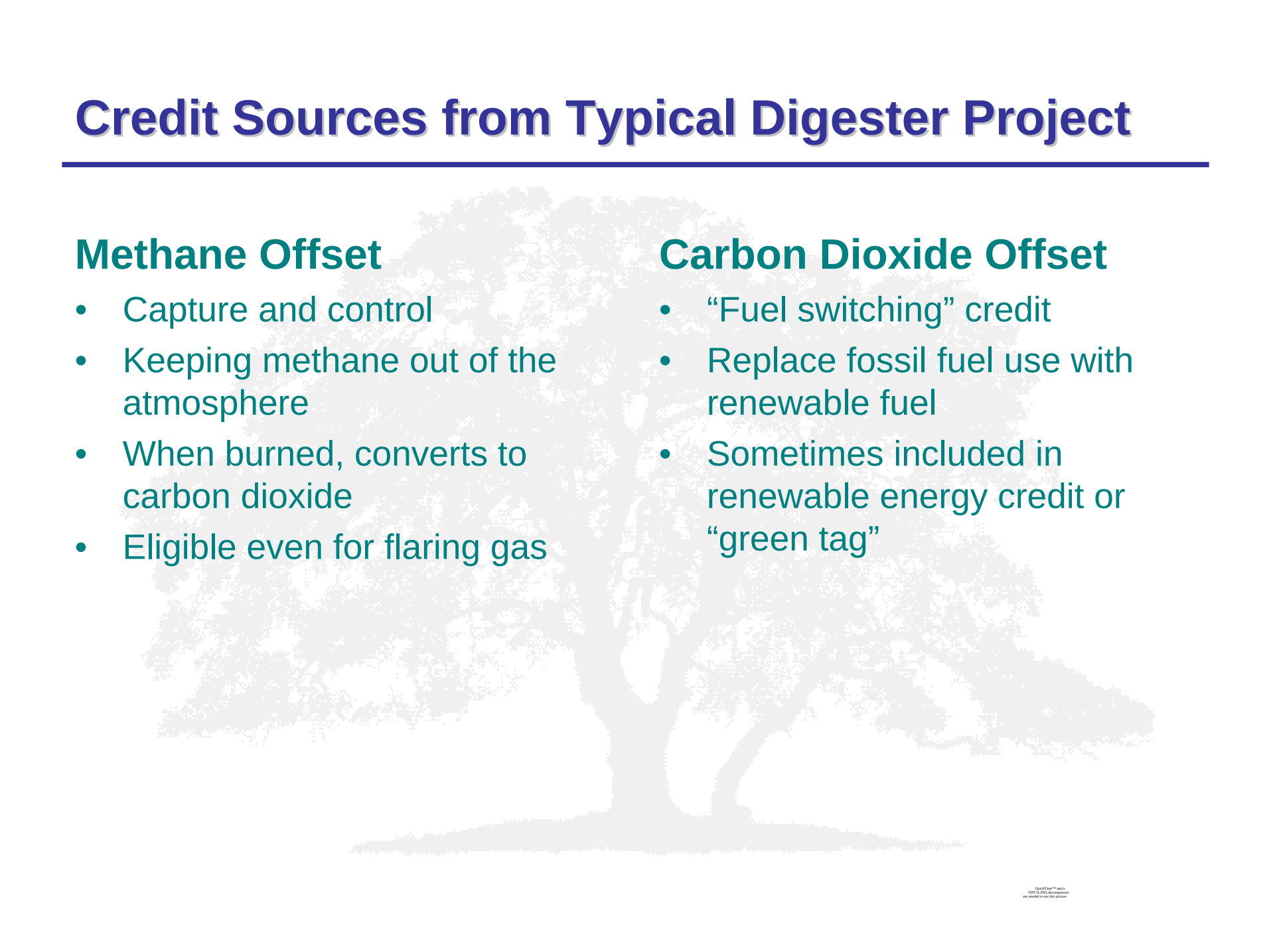
Credit Sources from Typical Digester Project

Methane Offset

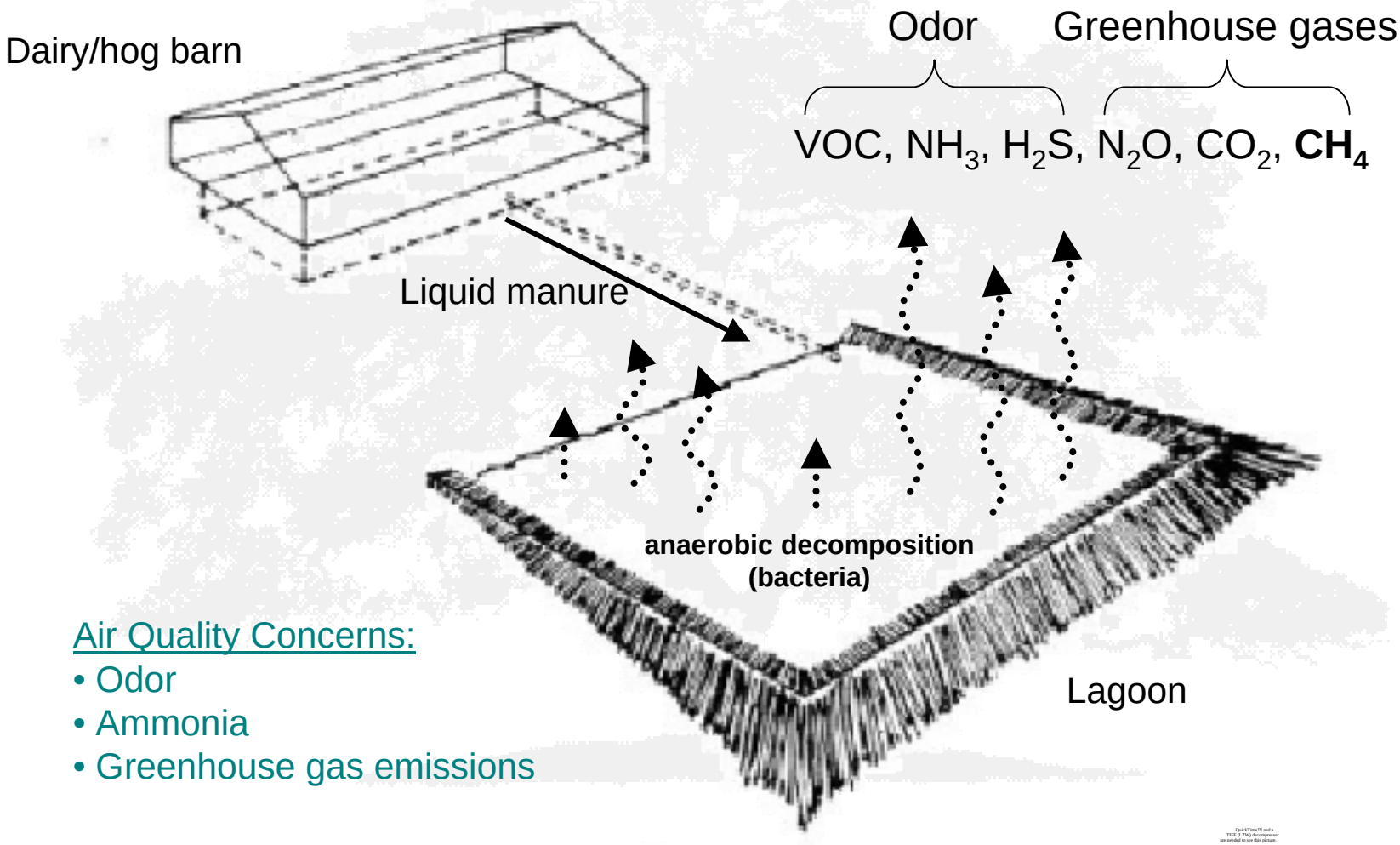
- Capture and control
- Keeping methane out of the atmosphere
- When burned, converts to carbon dioxide
- Eligible even for flaring gas

Carbon Dioxide Offset

- “Fuel switching” credit
- Replace fossil fuel use with renewable fuel
- Sometimes included in renewable energy credit or “green tag”



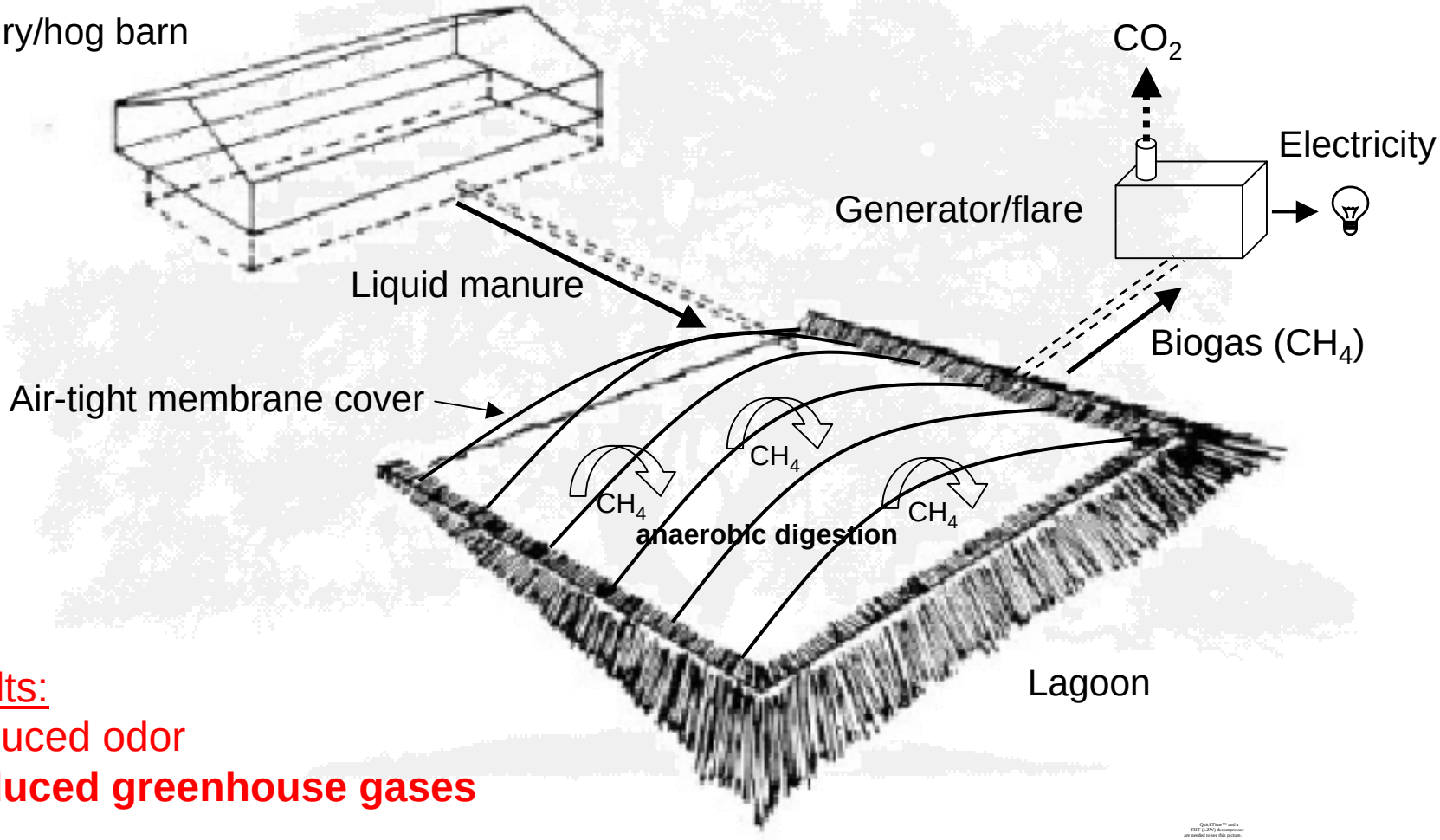
Problem: Open-Air Lagoons ("*baseline scenario*")



Air Quality Concerns:

- Odor
- Ammonia
- Greenhouse gas emissions

Solution: Covered Lagoons or Digesters



Results:

- Reduced odor
- **Reduced greenhouse gases**

Baseline Dairy Practices

Haubenschild Dairy, MN — lagoon and land apply

Vanderhaak Dairy, WA — lagoon and land apply

Hilarides Dairy, CA — lagoon and land apply

Bos Dairies, IN — new dairies

Port of Tillamook, OR — tank storage and land apply

Different geographic areas

Different types of lagoons, retention times

Different soil and crop types

INDIVIDUAL BASELINES = GREATER COSTS

CCX Approach for Ag Methane Projects

"Performance Standard"

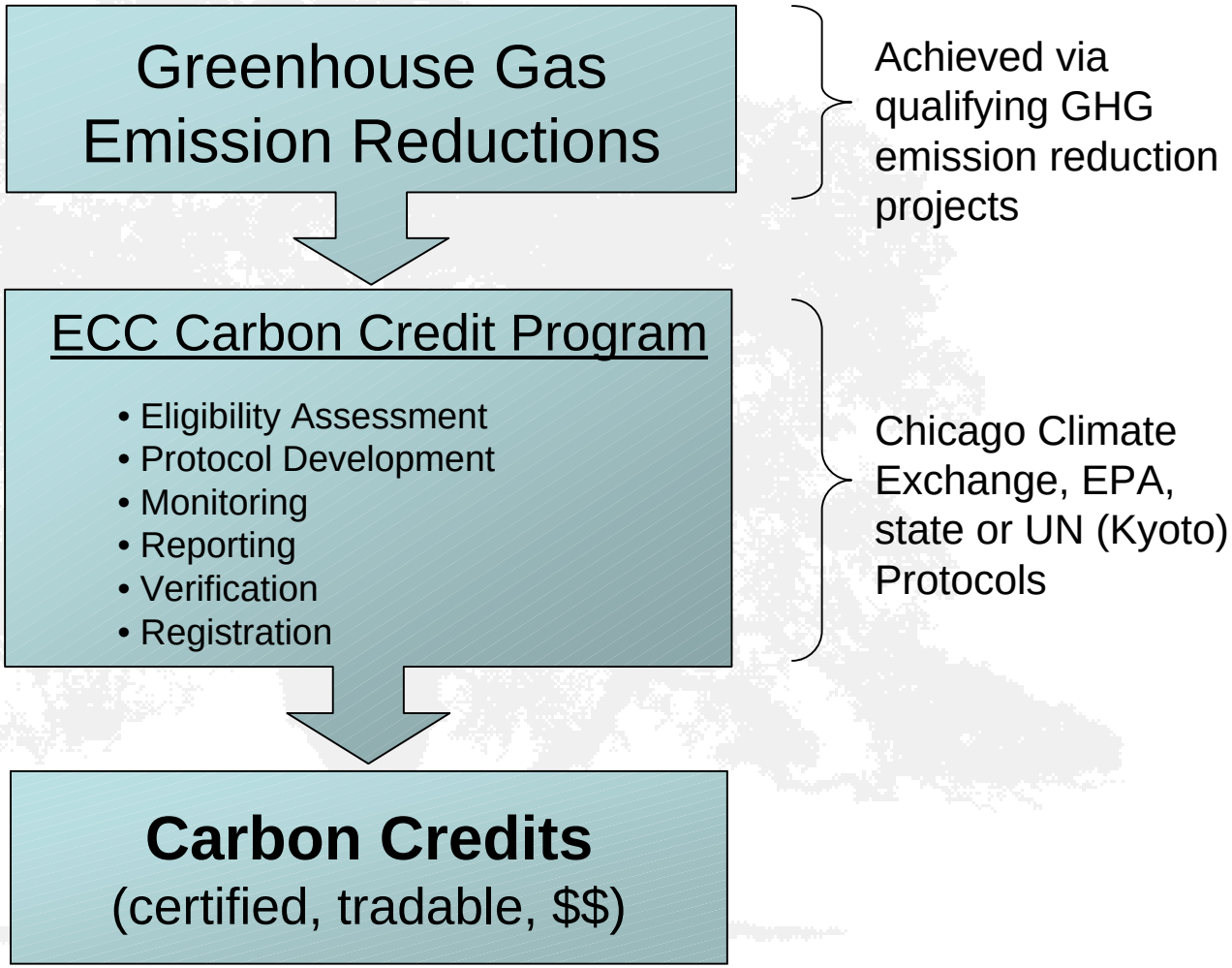
- Manure Management = 6% of US GHG
- Looks at individual projects as a category
- Simplify measurement, monitoring and verification with a generally accepted factor

Methane global warming potential = 21-23 greater

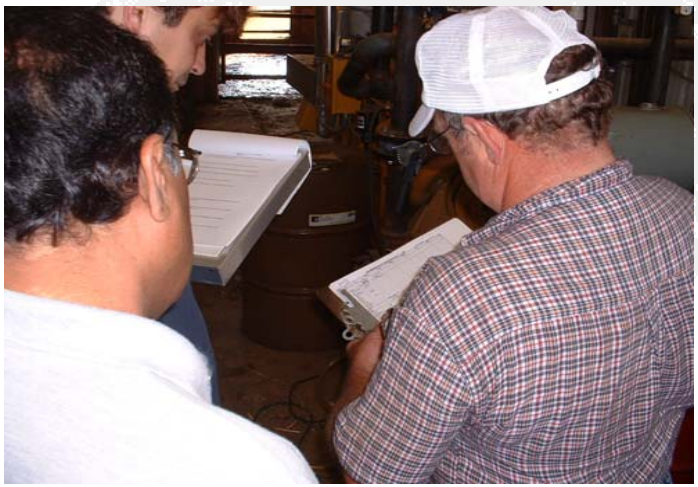
CCX conversion factor = 18.25

Balance = CO_2 released + fudge factor

ECC Carbon Credit Program



Project Partner Responsibilities



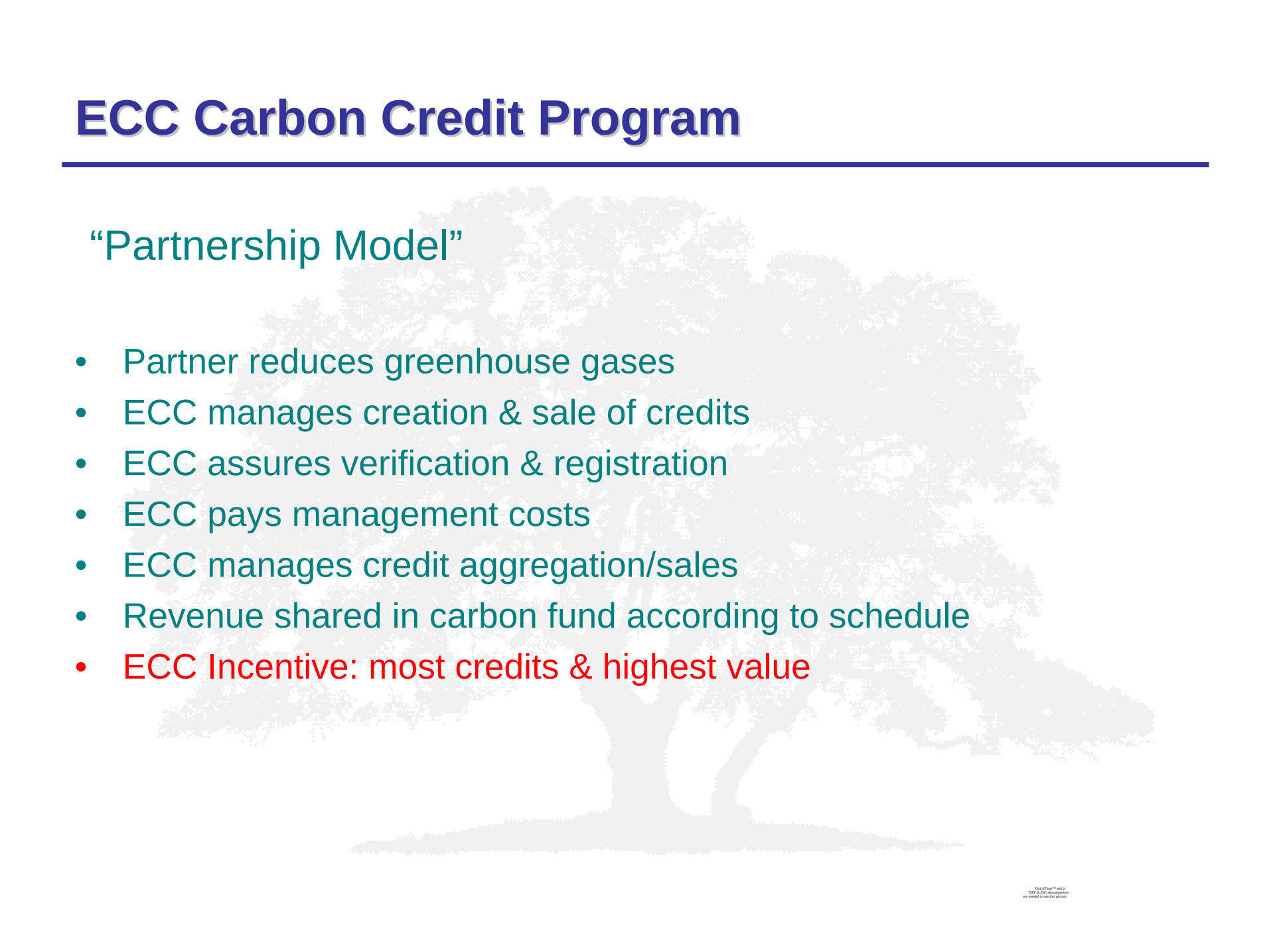
- Collect/destroy methane
- Data monitoring system
- Data collection/backup
- Recordkeeping
- Communicate changes
- Timely reporting to ECC

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

ECC Carbon Credit Program

"Partnership Model"

- Partner reduces greenhouse gases
- ECC manages creation & sale of credits
- ECC assures verification & registration
- ECC pays management costs
- ECC manages credit aggregation/sales
- Revenue shared in carbon fund according to schedule
- ECC Incentive: most credits & highest value



Haubenschild Dairy

- RCM plug flow digester
- 700 cows
- Start date September 1999 (eligible)
- Created methane offsets (retained REC credits)
- Used kW and gas data
- Created CCX credits back to 2003
- First to receive payment for credits (with VanderHaak)

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

VanderHaak Dairy

- GHD plug-flow digester, constructed by Andgar Corp.
- Capacity 1500 cows
- Start date late 2004
- Created methane offsets (sold REC credits to utility)
- kW data, adding gas meters
- Created 2004 and partial 2005 credits
- First to receive payment for credits (with Haubenschild)

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Hilarides Dairy

- Lagoon cover digester installed by EFI, 250,000 sf
- Capacity: 6000 heifers
- Four 125 kW generators
- Start date 2005
- kW and gas data
- Methane and fuel switching credits

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Bos Dairy Group

- Four dairies as a group
- Five GHD digesters (4 installed to date)
- Capacity: approx 3500 cows each
- Credit development in process
- Creating methane and fuel switching credits
- Adding meters to capture all available credits
- Goal: 1 million carbon credits

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Port of Tillamook

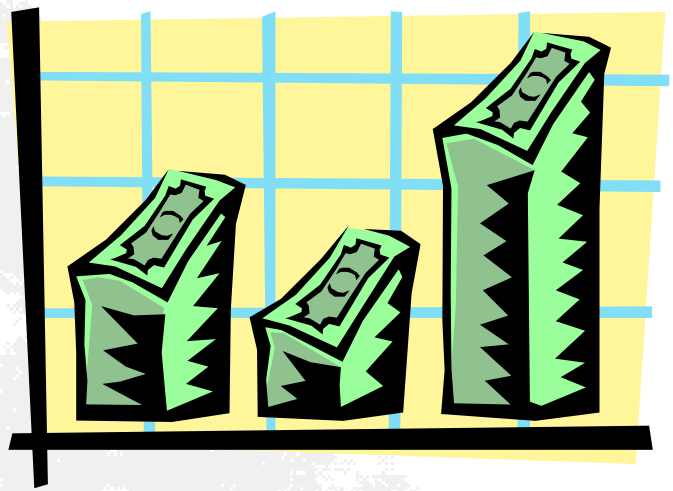
- Community digester project involving 8 dairies
- Four RCM plug flow digesters (2 operating)
- Capacity: 4000 cows
- Start date 2003
- Non-farm ownership requires extra eligibility review
- Credit development in process

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

2006 Economics Example

POTENTIAL REVENUE:

- Facility size = 1500 cows
- Est credit potential = 5 credits/cow
- Est credit value = $4/credit
- Deposit to farm account = $15,000 (50% of total)
- In ECC pool, partner controls timing

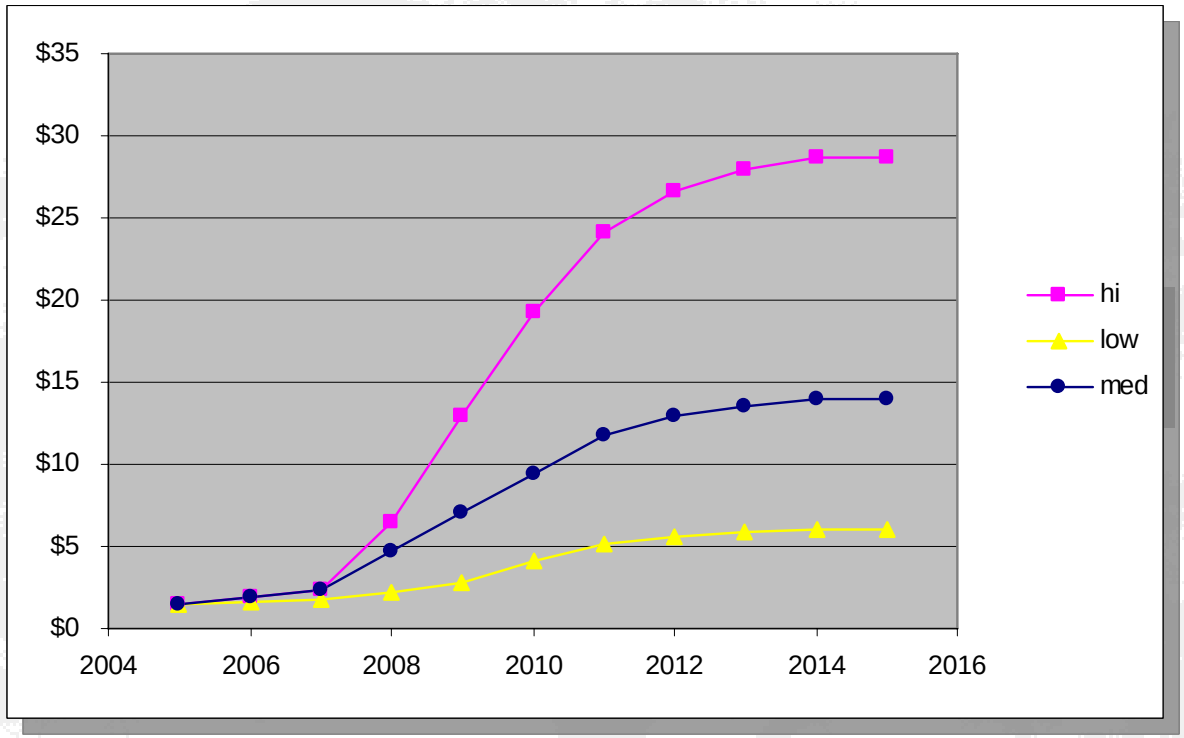


POTENTIAL COSTS:

- Capital-lagoon cover = $1.50 SF
- Flare: depends on local regulations
- Biogas meter = $5000
- Digester option = $600-$900/cow

Price forecasts for US carbon credits

Projected price curves for US carbon credits ($US per metric ton)

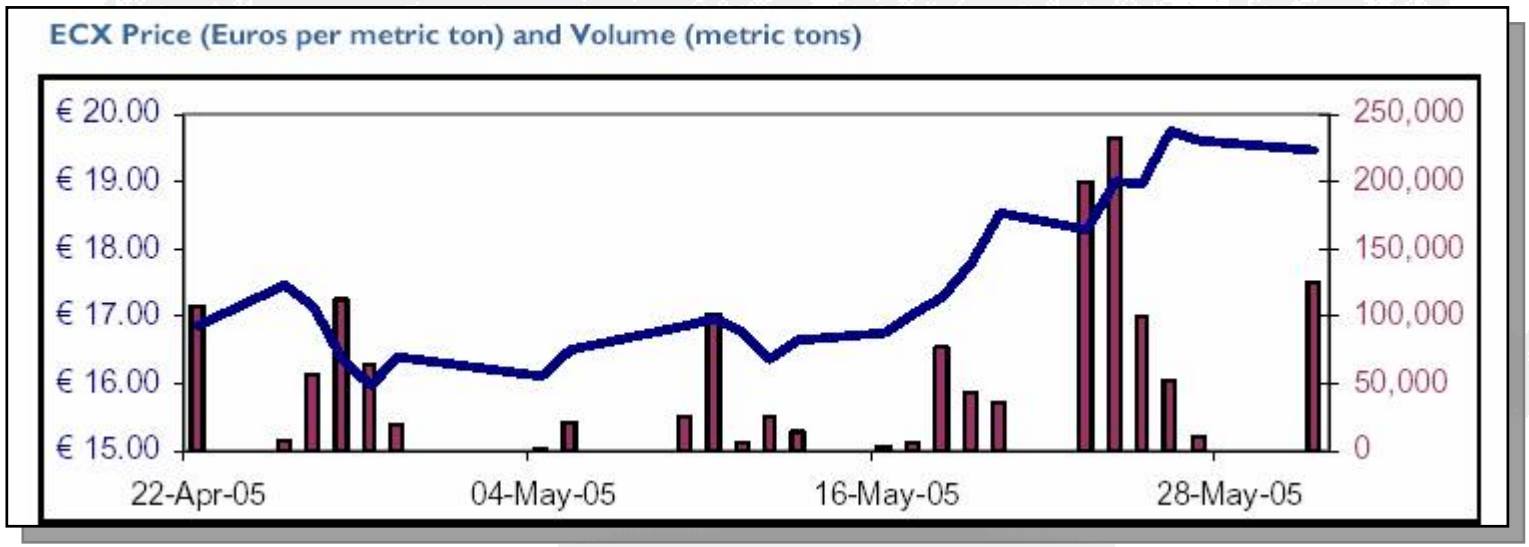


Sources: Carbon Finance, August 2004; EIA/DOE 2004. Analysis of S. 1844, the Clear Skies Act of 2003; S. 843, the Clean Air Planning Act of 2003; and S. 366, the Clean Power Act of 2003. Energy Information Administration, USDOE, SR/OIAF/2004-05, May 2004; EIA/DOE 2005. Impacts of Modeled Recommendations of the National Commission on Energy Policy. Energy Information Administration, USDOE, SR/OIAF/2005-02, April 2005; AEP 2004. An assessment of AEP's actions to mitigate the economic impacts of emissions policies. American Electric Power, August 31 2004

Global Market Expanding Rapidly

World market for carbon credits:

- 2003: **$125 million** (37 million tons CO_2e)[1]
- 2004: **$500 million** (>100 million tons CO_2e)[1]
- 2005: **>$5 billion** (*twice* the expected forecast in Feb, 2005)[2]
- 2010: **>$44 billion** (not including US)[2]

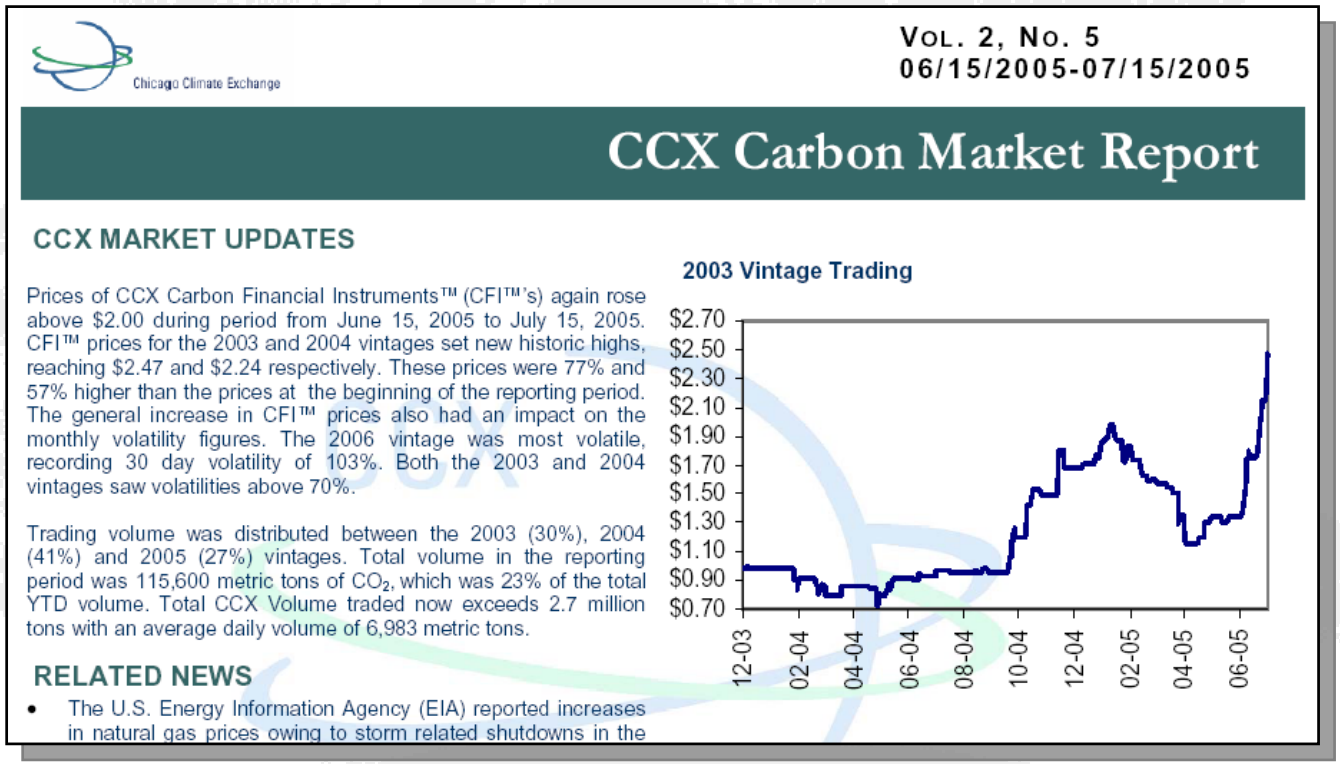


1 *Carbon Market Analyst*. October 14, 2004
2 *Point Carbon*, Feb 16, 2005

US Market Offers Big Opportunity

US market for carbon credits:

- $15–30 billion by 2012[1]



Chicago Climate Exchange

VOL. 2, NO. 5
06/15/2005-07/15/2005

CCX Carbon Market Report

CCX MARKET UPDATES

Prices of CCX Carbon Financial Instruments™ (CFI™'s) again rose above $2.00 during period from June 15, 2005 to July 15, 2005. CFI™ prices for the 2003 and 2004 vintages set new historic highs, reaching $2.47 and $2.24 respectively. These prices were 77% and 57% higher than the prices at the beginning of the reporting period. The general increase in CFI™ prices also had an impact on the monthly volatility figures. The 2006 vintage was most volatile, recording 30 day volatility of 103%. Both the 2003 and 2004 vintages saw volatilities above 70%.

Trading volume was distributed between the 2003 (30%), 2004 (41%) and 2005 (27%) vintages. Total volume in the reporting period was 115,600 metric tons of CO_2, which was 23% of the total YTD volume. Total CCX Volume traded now exceeds 2.7 million tons with an average daily volume of 6,983 metric tons.

RELATED NEWS

- The U.S. Energy Information Agency (EIA) reported increases in natural gas prices owing to storm related shutdowns in the

2003 Vintage Trading

1 Burtraw et al. 2002. Effect on Asset Values on Allocation of CO2 Emission Allowances. Resources for the Future Discussion Paper 02-15

It’s Time to Act
THANK YOU

“I think there is something, more important than believing: Action! The world is full of dreamers, there aren't enough who will move ahead and begin to take concrete steps to actualize their vision.” — W. Clement Stone